Programs and Apps: Using Apps for Productivity, Graphics, and Security

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Module Objectives (1 of 1)

By the end of the module, you should be able to:

- Identify the general categories of programs and apps
- Differentiate among the ways you can acquire programs and apps
- Identify the key features of productivity applications
- Identify the key features of graphics and media applications
- Explain how digital media is used online
- Identify the key features of file, disk, and system management tools
- Describe augmented reality, virtual reality, and artificial intelligence
- Identify the uses of personal-interest applications
- Identify the key features of security tools

How Do You Use Programs and Apps?

- All smartphones, computers, or tablets require a program or app to run.
- The terms "software," "program," and "app"are used interchangeably.
- Apps are categorized according to productivity, graphics and media, personal interest, and communications.

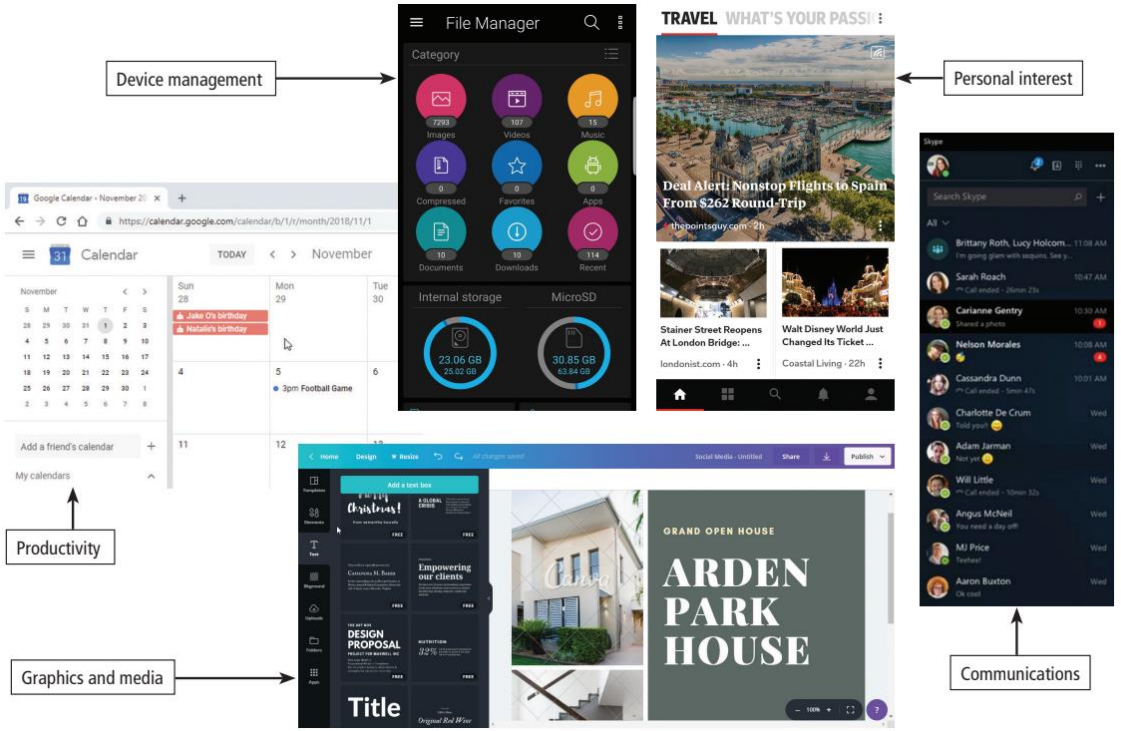


Figure 4-1 People use a variety of apps.

How Do You Use Programs and Apps?

- **Local apps** are apps that you install on your computer's hard drive.
- **Portable apps** run from a removable storage device such as an external hard drive, flash drive or the cloud.
- **A native app** is an app written for a specific operating system and installed on a computer or mobile device.
- **Web apps** are programs that you access via the Internet using a browser on a computer or mobile device.
- Apps that you access on a smartphone or tablet are called **mobile apps.**

How Do You Use Programs and Apps?

Some apps are available as both native and web apps.

- The native app allows you to search for an item to purchase by taking a photo of a product or its bar code with your device's camera or tapping the microphone to speak the names of items to add to your shopping cart.
- The mobile web app runs in a browser, as shown by the web address in the search bar.

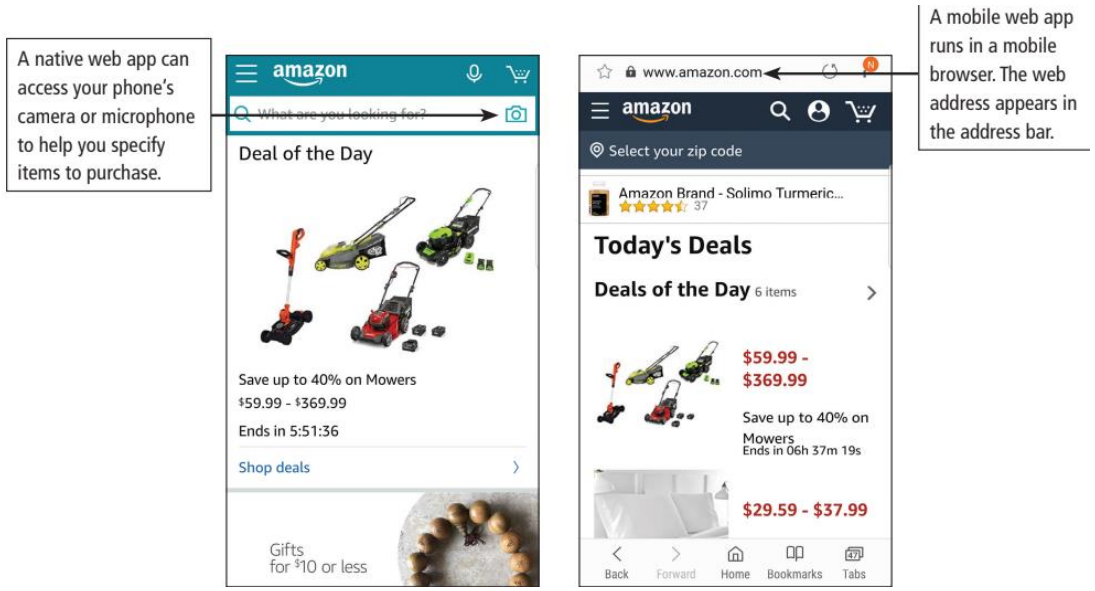


Figure 4-3 Amazon's native app (left) and web app (right).

How Do You Use Programs and Apps?

- **Web apps** rely on HTML5 (**Hypertext Markup Language**) to display information, JavaScript to manage the app's performance, and CSS (**Cascading Style Sheets**) to format information.
- By using **cross-platform** development tools, developers can build apps that work on multiple platforms.
- **Smart home devices** such as the Nest Thermostat have temperature sensors.
- **Google Home** or **Amazon Alexa** smart speakers have sensors that detect the sound of a voice.

Ethics and Issues: Acquire Programs and Apps Responsibly

- When you copy, distribute, download, or otherwise use without permission or payment any programs and apps, you are **violating the law**.

- The copyright law led to the development of digital rights management (DRM). **DRM** for programs and apps defines restrictions regarding their use, modification, and distribution.

Figure 4-7 Passwords and biometrics are types of access controls.

Ethics and Issues: Acquire Programs and Apps Responsibly

- Programs and apps are distributed in a variety of forms: retail, custom, software as a service (SaaS), shareware, freeware, open source, and public domain.
- **Shareware** is copyrighted and distributed at no cost for a trial period. Payment is to be made to use shareware beyond that period unless you cancel within a specified period.
- **Freeware** is copyrighted and provided at no cost by an individual or a company that retains all rights.
- **Open-source** programs and apps have no restrictions from the copyright holder regarding modification and redistribution; users can add functionality and sell or give away their versions to others.
- **Public domain** programs and apps have been donated for public use and have no copyright restrictions.

Ethics and Issues: Acquire Programs and Apps Responsibly

A **license agreement** specifies the number of devices on which you can install the product, any expiration dates, and other restrictions.

Table 4-4 Types of license agreements.

Type	Description
Single-user or **end-user license agreement** (EULA)	Grants permission for one installation
Multiple-user license agreement	Allows a specified number of users access the program or app
Site license	Allows an organization to provide access to as many users as they want, either by individual installations or by providing network access or Internet passwords

Ethics and Issues: Acquire Programs and Apps Responsibly

Update Programs and Apps

- **Updates** can prevent or repair problems, provide additional functionality, or address any security or other issues.
- Many desktop and mobile apps use an **automatic update** feature that provides the latest system software and security updates automatically.
- Updates that address a single issue are called **patches.**
- A **service pack** is a collection of updates combined in one package.
- **Upgrades** are new releases of the program or app and may require an additional fee to enable the upgrade to install.

Productivity Apps

- **Productivity apps** are apps for personal use that you may use to create documents, develop presentations, track appointments, or stay organized.
- Productivity applications include **word processing, spreadsheets, presentations, databases, productivity suites, and enterprise computing**.
- During the process of developing a project, you will likely switch back and forth between the following activities.
  - ✓When you create a project, you enter text or numbers, insert images, add contacts, schedule appointments, and perform other tasks using a variety of input methods, such as a keyboard, a mouse, touch, or voice.
  - ✓To edit is to make a change to the contents of a document, worksheet, or presentation, such as font, spacing, and alignment, among others.

Productivity Apps

A **productivity suite** is a collection of individual related applications available together as a unit.

Table 4-7 Popular productivity suites.

	Microsoft Office	Apple iWork	G suite	Open Office
Operating systems supported	Windows, macOS or web apps	macOS, iOS, or web apps	ChromeOS or web apps	Windows, Linux, macOS
Word processor	Microsoft word	Pages	Google Docs	Writer
Spreadsheet	Microsoft Excel	Numbers	Google Sheets	Calc
Presentation	Microsoft PowerPoint	Keynote	Google Slides	Impress
Database	Microsoft Access			Base
Email	Microsoft Outlook	Apple mail	Gmail	
Online version	Office Online	iWork for iCloud	G Suite	
Cloud storage	Microsoft OneDrive	iCloud	Google Drive	

Graphics and Media Applications

- **Digital graphics and media** include still images, animated images, and audio.
- **Digital media apps** fall into two categories:
  - ✓ Apps that are used to capture, edit, and create digital media
  - ✓ Apps that play digital media
- **Digital graphics and media** make digital content appealing and entertaining.

- The major types of digital media include graphics, animation, video, and audio.

Figure 4-20 Types of digital media.

Graphics and Media Applications

How Computers Represent Images and Sounds

- Cameras, musical instruments, and video projectors are **analog devices.**
- Computers are **digital devices**.
- A digital recorder turns the sound into numbers representing tones and then generates an electronic signal of numbers.

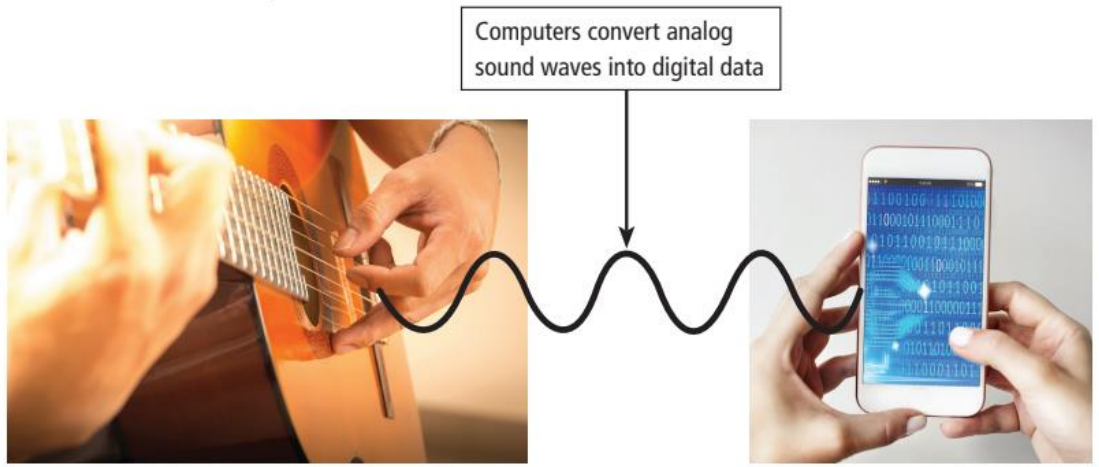


Figure 4-22 Converting analog data into digital data.

Graphics and Media Applications

Digital Graphics

- Digital graphics fall into two main types:
  - ✓ **Bitmap graphics** (raster graphics) assign colors to the smallest picture elements, called **pixels.**
  - ✓ **Vector graphics** consist of shapes, curves, lines, and text created by mathematical formulas.
- **Bitmaps** can be created and edited using graphics apps, such as Adobe Photoshop and Windows Paint.
- Bitmap-editing programs are painting programs.
- Adobe Illustrator is used for creating and editing **vector** images.

Graphics and Media Applications

Resolution and Compression

- **Resolution** refers to the clarity or sharpness of an image: the higher the resolution, the sharper the image and the larger the file size.
- On a digital camera, resolution is typically measured in **megapixels, or millions of pixels.**
- **High-resolution** photos and other complicated graphics can be difficult to copy, download, or send as email attachments.
- **Compression** makes digital media files smaller by reducing the amount of data in the files.
- Some types of bitmap graphics (JPEG files) use **lossy compression,** and other types of media files (TIF, PNG, and GIF) can be compressed using **lossless compression.**

Graphics and Media Applications

Table 4-8 Common graphics file formats.

Graphic File Format	File Extension	Best Use/notes
Bitmap Graphics		
GIF	.gif (Graphics Interchange Format)	Simple web graphics and short web animations Format is limited to 256 colors; supports transparency; small file size makes it good for websites
JPEG	.jpeg or .jpg (Joint Photographic Experts Group)	Photos on the web, high-quality photos and printed graphics Large file sizes are better suited for print than web use Images have rich colors but discard some data to reduce file size, which can affect quality
PNG	.png (Portable Network Graphics)	Logos, icons, and illustrations Images have good quality even when highly compressed; supports 16 million colors; better quality and smaller file size than GIF
TIF	.tif or .tiff (Tagged Image File Format)	High-quality photos and printed graphics Large file sizes are better suited for print than web use
Vector Graphics		
EPS	.eps (Encapsulated PostScript)	Logos and other illustrations that are frequently resized A standard format for exporting vector graphics without data loss
SVG	.svg (Scalable Vector Graphics)	Illustrations on the web Developed by the World Wide Web Consortium (W3C); allows interactivity and animation

Graphics and Media Applications

Table 4-9 Common audio file formats.

Graphic File Format	File Extension	Compression	Notes
AAC and M4P	.aac and .m4p	Lossy	Apple uses these formats for iTunes downloads
AIFF (Audio Interchange File Format)	.aiff or .aif	None	Files are large; good to excellent sound quality
MP3	.mp3	Lossy	Common format for music and audio books; most digital audio devices can play MP3 files
WAVE or WAV (Waveform Audio)	.wav	None	Files are large; good to excellent sound quality
WMA (Windows Media Audio)	.wma	Lossless	Played using windows media player; also copy-protected

Graphics and Media Applications

- **Synthesized music** is created as a digital file from the start using electronic instruments called synthesizers, or synths, for short.
- To play a **synthesizer**, you press a key on the keyboard, generating an electrical current that becomes sound
- Musicians play **synthesizers**, which look like piano keyboards, to mimic sounds from acoustic or electric instruments or to produce unusual sounds that other instruments cannot generate.

Figure 4-25 Musician playing a synthesizer.

Graphics and Media Applications

- A video that is shared millions of times over social media in a short period is called a **viral video.**
- Digital video files have two parts:
  - ✓ A **codec** encodes and usually compresses data for storage and then decompresses the data for playback.
  - ✓ A **container** which bundles the video, audio, codec, and other parts into a single package.
- Video codecs are compatible with only some containers.

Graphics and Media Applications

- **Video file formats** are one way to describe a video file.
- **Resolution** is another format.
- 720p, HD, or 4K, given as descriptions of videos refer to **resolution**.
- **Digital video resolution** is given as width × height.
- **Video resolutions** can be organized into three categories:
  - ✓ Standard Definition (SD): Resolutions of 640 × 360 and 720 × 480
  - ✓ High Definition (HD): Resolutions of 1280 × 720 and 1920 × 1080 (Full HD)
  - ✓ Ultra High Definition (UHD): The 4K standard provides a resolution of 3840 × 2160, while the 8K standard provides a resolution of 7840 × 4320

Graphics and Media Applications

Animation in Entertainment

- The most popular uses of **3-D animation** are in ads, films, and computer games.

Ways to Create a Solid 3-D Image

- Apply highlights and shadows to a **wireframe drawing** (a 3-D object composed of individual lines) in a process called **rendering**.
- **Stop motion animation**, in which animators move real-life objects through a sequence of poses and capture the movements one frame at a time.

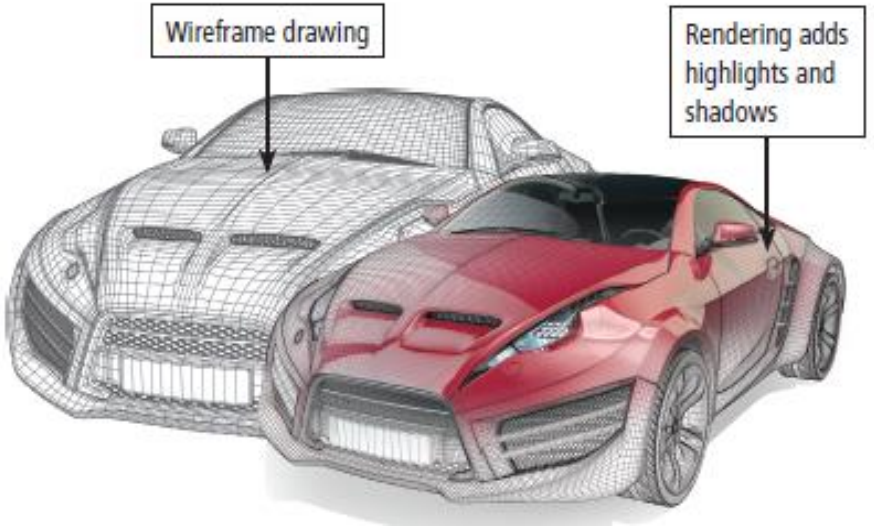


Figure 4-30 3-D rendering.

Digital Media on the Web

- **Streaming the media** means receiving the audio or video content on your computer from a server and then watching or listening to the media as it arrives.
- For **on-demand content,** such as **television shows**, the original media file is stored on the media distributor's server.
- With **live video streaming,** often used for sports events, the content is sent out live, as it happens, and is available only once.
- **Streaming video** is more convenient and less expensive than traditional cable and satellite television content.
- Streaming **digital audio** in the form of audio books, using sites such as Audible, and as audio podcasts, may include news stories, music, lectures, or radio shows.

Virtual and Augmented Reality and Artificial Intelligence

- **Virtual reality (VR)**, a computer-simulated, 3-D environment that you can explore and manipulate, attempts to remove the barrier between the viewer and the media.
- **Augmented reality (AR)** apps overlay information and digital content on top of physical objects or locations.
- In a virtual world, a 3-D computer model creates a convincing illusion of depth and space to make you feel you are part of a real scene you can explore.

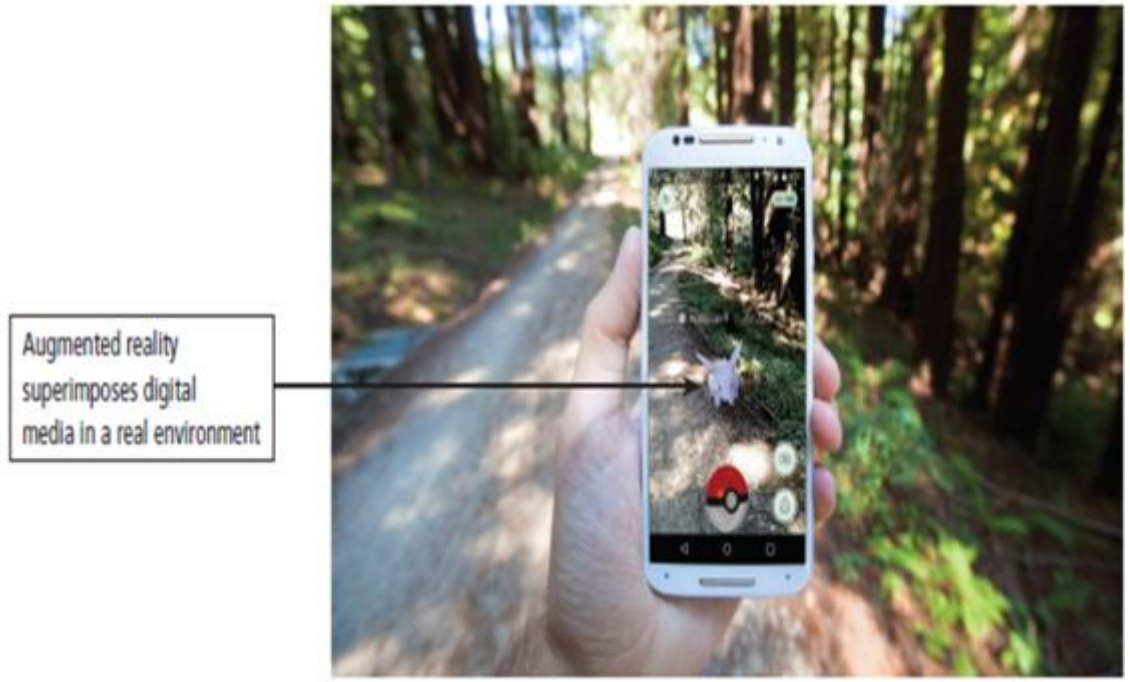


Figure 4-34 AR game Pokemon Go on a smartphone.

Virtual and Augmented Reality and Artificial Intelligence

- **Artificial intelligence (AI**) is the technological use of logic and prior experience to simulate human intelligence.
- **Machine learning** is a branch of AI that trains machines to learn from data, identify patterns, and make decisions to progressively improve their performance without much human intervention.
- Some of the practical uses of AI include strategic gaming, military simulations, statistical predictions, and self-driving cars.
- Navigation apps, which provide you with information about traffic and the best routes, along with preferred stops along your way.
- Security, such as using your fingerprint to access your phone, or facial recognition and motion-detection cameras that alert you to unusual or unauthorized visitors.

Virtual and Augmented Reality and Artificial Intelligence

- **Natural language processing** is a form of data input in which computers interpret and digitize spoken words or commands.
- **Digital assistants** use natural language processing to respond to verbal commands or questions, using search technology to provide answers or perform a task.

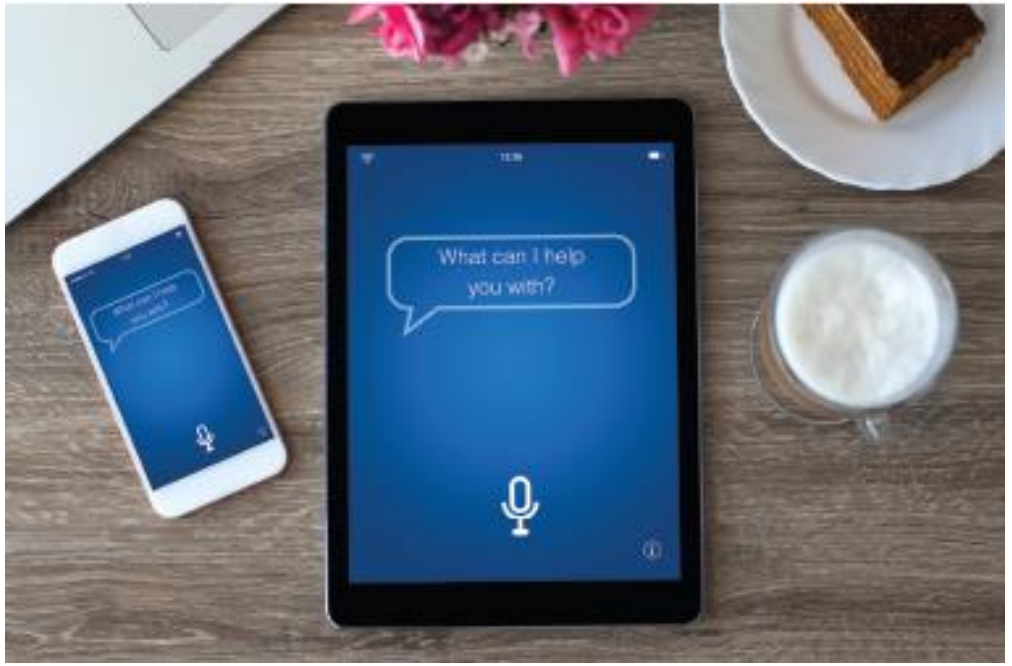


Figure 4-38 Smart devices provide you with assistance.

Secure IT: Security Tools

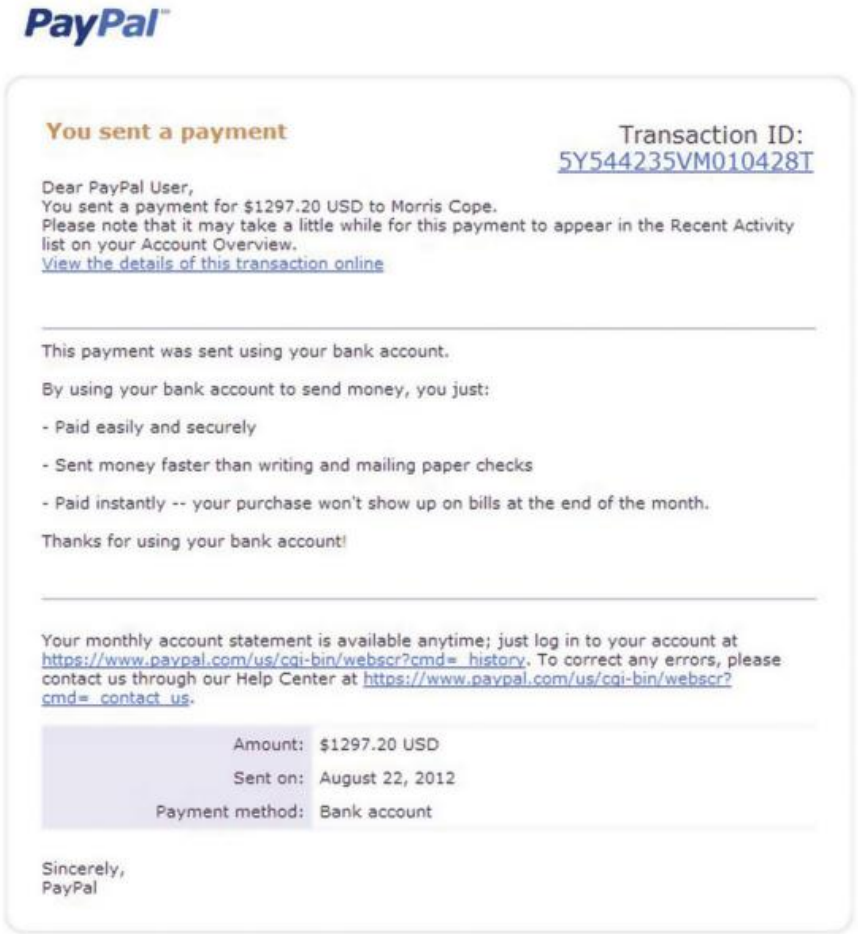
- To protect your computer and mobile devices against malware, you can use one or more **security tools**.
- These security tools include personal **firewalls, antivirus programs, malware removers, and Internet filters.**
  - A **firewall** is a protective barrier between a computer or network and others on the Internet.
  - An **antivirus app** protects a computer against viruses by identifying and removing any computer viruses found in memory, on storage media, or on incoming files.

Secure IT: Security Tools

- If an **antivirus program** identifies an infected file, it attempts to remove the malware.
- If the **antivirus program** cannot remove the infection, it often quarantines the infected file.
- A **quarantine** is a separate area of a hard drive that holds the infected file until the infection can be removed.
- **Quarantined files** remain on a computer or mobile device until the user deletes them or restores them.

Secure IT: Security Tools

- **Web filtering software** is a program that restricts access to certain material on the web.
- **Phishing** is a scam in which a perpetrator sends an official-looking email message that attempts to obtain your personal and/or financial information.
- Some browsers include phishing filters.
- A **pop-up blocker** or pop-under blocker is a filtering program that stops pop-up or pop-under ads from displaying on web pages.



PayPal

You sent a payment

Transaction ID: 5Y544235VM010428T

Dear PayPal User,
You sent a payment for $1297.20 USD to Morris Cope.
Please note that it may take a little while for this payment to appear in the Recent Activity list on your Account Overview.
View the details of this transaction online

This payment was sent using your bank account.

By using your bank account to send money, you just:

- Paid easily and securely

- Sent money faster than writing and mailing paper checks

- Paid instantly -- your purchase won't show up on bills at the end of the month.

Thanks for using your bank account!

Your monthly account statement is available anytime; just log in to your account at https://www.paypal.com/us/cgi-bin/webscr?cmd=_history. To correct any errors, please contact us through our Help Center at https://www.paypal.com/us/cgi-bin/webscr?cmd=_contact_us.

Amount:	$1297.20 USD
Sent on:	August 22, 2012
Payment method:	Bank account

Sincerely,
PayPal

Figure 4-41 Phishing email message.

Secure IT: Security Tools

- **Ransomware** is a type of attack that affects your files and personal data. Some attacks encrypt your data and files or otherwise restrict access.
- Some ransomware threatens to publish your personal data, or in the case of a corporation, sensitive company files, unless a payment is made.

Figure 4-42 Ransomware attacks affect your data and files until you pay.


Thank You